REMARKS

This paper responds to the Office Action mailed on November 29, 2005.

Claims 17, 25, 34, 38 and 40 are amended, claims 30-32 are canceled without prejudice or disclaimer, and no claims are added; as a result, claims 10-29, 33-38 and 40 are now pending in this application.

In the Specification

The specification has been amended to update the priority data to include the issued patent number of parent Application No. 09/436,306.

§112 Rejection of the Claims

Claims 38 and 40 were rejected under 35 U.S.C. § 112, second paragraph, for indefiniteness. Specifically, the phrase "a base having a first portion and a second portion having a lateral extent in contact with the emitter to define an emitter-base surface" was stated to be indefinite.

Applicant has amended claims 38 and 40 have been amended to clarify that it is the second portion of the base that is in contact with the emitter. Applicant respectfully submits that this amendment renders the claims definite, and requests that this rejection be withdrawn.

§102 Rejection of the Claims

Claims 10 and 25-29 were rejected under 35 U.S.C. § 102(b) for anticipation by Applicant's Admitted Prior Art (AAPA). Applicant respectfully traverses this rejection.

The outstanding Office Action states in paragraph 4 on pages 3 and 4, that with regard to claims 10 and 25, and figure 1, discloses "the implant surface area being greater than the emitter surface area and less than the intrinsic base surface area, as can be seen in the figure". Applicant respectfully submits that this interpretation of the AAPA is incorrect, and is inconsistent with the Examiner's previous interpretation of the AAPA with regard to the allowance of claims 10-16 and 33 in the previous Office Action dated July 27, 2005. The allowance of these claims has not

been withdrawn in the present Office Action, the claims were not amended in the previous response, and thus the Examiner's position is inconsistent with the previous action.

First, the wording of the rejection is believed to be incorrect, since it states that the implant is "less than the intrinsic base surface area", whereas the claims in question recite that the area is either the total base area (as in claim 10) or "*the intrinsic base surface area* " (as in claim 25). This interpretation in the Office ACtion is believed incorrect, since the surface area of the intrinsic base extends basically under the emitter contact area, as would be clear to one of ordinary skill in the art. Thus, Applicant will respond to the rejection as if the wording was as the Examiner is believed to have intended, specifically that the implant area is less than the surface area of the base region.

The AAPA discloses in figure 1, with specific reference to how the figure might relate to claims 10 and 25, a transistor having a total surface area that extends from the edges of the field oxide isolation regions, which is broken up into essentially a first base region (the base contact), a second base region (the intrinsic base), and a third base region (the other base contact). The implant area (labeled local implant) is in contact with the second base region (intrinsic base), and since the implant is performed through the opening between the field oxide edges, the size of the local implant area is greater than the size of the field oxide opening by at least the standard lateral distribution of the ion implantation as well as the lateral diffusion due to the heating from the anneal process. Thus, the local implant is necessarily greater than the surface area of the base region.

Thus, the local implant in the AAPA has (and illustrates) an extent that is greater than the surface area of the base, which then can not disclose an implant that is "...*greater than the surface area of the emitter and less than the surface area of the base region* ...", as recited in claim 10, wherein the referred to base region is the sum of the first, second and third base regions. Similarly, "...*the implant surface area being greater than the emitter surface area and less than the intrinsic base surface area* *between the surface edges of the extrinsic base surrounding the intrinsic base* ...", as recited in claim 25, as amended herein for greater clarity.

Dependent claims 26-29 are believed to be patentable over the AAPA at least as depending from a base claim shown above to be patentable. Applicant respectfully requests that

this rejection be reconsidered and withdrawn, and that the previously allowed claims be passed to issue.

§103 Rejection of the Claims

Claims 17-24, 30-32 and 34-37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Grubisich (U.S. 5,581,115). Applicant respectfully traverses this rejection.

The cited reference discloses in prior art figure 2 (as referred to in the Office Action) an implant region 58, which increases the "collector doping below the emitter and intrinsic base (see col. 5, line 1). The "edges of the intrinsic base below the emitter termination regions are selectively provide with additional base dopant" (see col. 4, line 42) which merges with the more heavily doped base contact zones 54.

Applicant respectfully submits that the cited reference, whether taken alone or in any combination with other well known art, neither describes nor suggests the claimed feature of "*...a first implant region interposed between the collector region and the base region ... having an effective surface area greater than the surface area of the emitter region contiguous to the base region and less than the area of the intrinsic base region contiguous to the collector region* ...", as recited in claim 17, as amended herein. As shown and discussed in the cited reference, the prior art has a base contact zone that places heavily doped p-type regions 54 into contact with a relatively heavily doped n-type implanted region 58, resulting in reduced collector base breakdown voltages and increased leakage currents. Thus, the implant region 58 in the cited reference does not have an area that is *less than the area of the intrinsic base region* 52, but rather butts up to the extrinsic base region 54. Claims 18-24 are dependent upon base claim 17, and are held to be patentable for at least that reason.

Claims 30-32 have been cancelled with out prejudice, or waiver of patentable content, and Applicant reserves the right to resubmit the claims at a latter date.

Claim 34, as amended herein, is believed to be patentable over the cited reference, whether taken alone or in any combination with other well known art, for similar reasons to that given above with reference to claim 17. Specifically, the cited reference does not describe or suggest "*...the implant surface area being greater than the emitter surface area and less than*

the intrinsic base surface area ...", as recited in claim 34. As discussed above, the cited reference shows the implant contacting the extrinsic base. Claims 35-37 are dependent upon base claim 34, and are held to be patentable for at least that reason.

In view of the above noted claim amendments and discussion, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claims 13-16 and 33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Grubisich. Applicant respectfully traverses this rejection.

The cited references have features discussed above with reference to the previous rejection, and in previous responses. The cited reference does not suggest at least the claimed feature of an implant region "*...having an effective surface area greater than the surface area of the emitter region and less than the area of the intrinsic base region ... in contact with the base region, and spaced apart from the extrinsic base region ...*", as recited in claim 13, which was previously held by the Examiner to be allowable over the cited references. The AAPA has the implant region with either a greater extend than the surface extent of the base region, as discussed extensively above, or with an implant region that is the same as the emitter, and the referenced figure 2 of Grubisich has the extrinsic base 54 in contact with the implant region 58. Thus claims 13-16 have features that are not described or suggested by the suggested combination of references.

The suggested combination does not describe or suggest at least the feature of "*...an implant area of the collector region vertically adjacent to the first portion of the base region having an increased collector doping of an implanted impurity, the implant area having an effective surface area that is in contact with the base region, greater than the surface area of the emitter region and less than the surface area of the first portion of the base region ...*", as recited in claim 33, which was previously held by the Examiner to be allowable over the cited references. The reasoning is similar to that given above.

In view of the above discussion, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA as applied to claim 10 above, and further in view of Grubisich. Applicant respectfully traverses this rejection.

The AAPA and Grubisich have features that have been discussed above. The cited reference of Grubisich is used in the Office Action to show the missing feature in the AAPA of the use of boron and phosphorus to dope the collector regions.

Applicant respectfully submits that the addition of Grubisich to the AAPA does nothing to correct the previously noted failures of the AAPA to disclose the features of claim 10, specifically an implant that is "*...greater than the surface area of the emitter and less than the surface area of the base region ...*", as recited in claim 10, wherein the referred to base region is the sum of the first, second and third base regions.

Dependent claims 11 and 12 are held to be patentable over the suggested combination of references, at least as depending from a base claim shown above to be patentable over the same combination of references. Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Allowable Subject Matter

Claims 38-40 were indicated to be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112 set forth in the Office Action. Applicant thanks the Examiner for the indication of allowable subject matter. Applicant has rewritten claims 38 and 40 to address the rejection by making it more clear that the second portion of the base is in contact with the emitter, and respectfully requests that these claims be allowed.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney David Suhl at (508) 865-8211, or the undersigned attorney at (612) 349-9587 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

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Date 22 Feb '06

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 22 day of February, 2006.

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